

Field-of-View Expansion for Holographic Near-Eye Displays

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We propose a new design to expand a field-of-view (FOV) of holographic near-eye displays (HNEDs). HNEDs is one of the methods to realize AR glasses. The practical application of HNEDs requires both a wide FOV and a wide eye-box. However, a trade-off between the FOV and the eyebox has been difficult to achieve so far. The proposed design is based on a holographic system that scans a hologram plane by waving a mirror or a dehidral corner reflector array (DCRA). The system is built as a benchtop prototype by introducing a method to accelerate hologram computation. We tested whether a new optical design for scanning the hologram surface could increase the FOV without narrowing the eye-box. The experiment demonstrated that the viewing angle can be increased by a factor of about 2. We also discuss the challenges of integrating this system into practical HNEDs.

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